



April 26, 2005

William A. Bonnet  
Vice President  
Government and Community Affairs

The Honorable Chairman and Members of  
the Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Docket No. 03-0371 – Proceeding to Investigate Distributed Generation in Hawaii

Attached is an analysis with respect to the under-recovery of demand costs related to the installation of a third-party combined heat and power installation. HECO/HELCO/MECO had offered to prepare such an analysis at the Distributed Generation Investigation hearing on December 10, 2004.<sup>1</sup>

If you have any questions on this matter, please contact Dan Brown at 543-4795.

Sincerely,

Attachments

cc: Division of Consumer Advocacy (3)  
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<sup>1</sup> See the Transcript of Proceedings, Volume III, taken on December 10, 2004, pages 76-85.

The attached information is provided in response to a request made at the Distributed Generation ("DG") Investigation Panel Hearing on December 10, 2004 (Transcript Vol. III, pages 83-85) as to what the minimum electrical "consumption" is that a customer with a CHP system has to have (from kilowatt hours supplied by the utility) to make the electric utility "whole". (The Companies construed this to mean the minimum number of kilowatt hours that a customer would have to purchase for the utility to recover the demand-related costs properly "attributable" to the customer.)

The question arose because the utility recovers some demand costs through demand charges and some demand costs through energy charges. Thus, when the customer's electric usage (from the grid) is reduced through the installation of a CHP system that supplies (and also offsets) part of its electric usage, the utility's recovery of demand costs from the customer is reduced.

In order to recover 100% of the demand costs previously recovered (with no change in rate design), the customer's billing demand and kwh usage would have to remain the same before and after installation of the CHP system, which would only be the case if the CHP system did not operate. However, none of the parties (including the Companies) contended that the utility would have to recover 100% of the demand costs formerly recovered from the customer.

The parties did not agree on the appropriate amount of demand-costs to be recovered from a customer with a CHP system (i.e., the amount of demand costs to be recovered to make the utility "whole", or to recover the demand costs that are properly attributable to such a customer) or even on how to determine the answer. (The parties did suggest that the answer would be different depending on the type of demand cost being considered -- i.e., the percentage might be different for production costs than for transmission costs or for

distribution costs.) The Companies understand, however, that this informational filing is not the vehicle in which to argue what the appropriate amount of demand costs to be recovered from customers with CHP systems should be.

Therefore, to respond to the question, the Companies have calculated the amount of lost demand cost recovery due to an illustrative CHP system installation (for two CHP operating scenarios).

If the existing rate design does not recover the "appropriate" amount of demand cost in some or all cases, then the mechanism proposed by various parties to recover demand costs attributable to standby service is a separate demand charge (which could be in the form of a fixed monthly reservation charge, a usage charge, or a combination thereof, or in some other form). The Companies have provided calculations of what the standby charge would have to be (if assessed only in the form of a monthly reservation charge) to recover 30%, 60%, and 100% of the demand costs.

The Companies' position is not that neither % is the correct %. (The Companies' position on standby rates is in its Opening Brief, pages 124 to 130, and in its Reply Brief, pages 18 to 24.) The sole purpose of providing the information is to provide a range of information to the parties and Commission.

#### **Impact of 3<sup>rd</sup> Party CHP on the Recovery of Fixed Demand Costs**

The reduction in fixed cost recovery occurs because HECO's energy rates approved by the Commission recover a portion of the fixed demand costs. Thus, when 3<sup>rd</sup> party CHP reduces the customer's purchase of energy from the utility, the resulting reduction in the energy charge revenue also reduces the amount of fixed demand costs recovered.

On the other hand, the installation of 3rd party CHP also increases the demand cost recovered per kwh for the remaining kwh purchased from the utility. This increase in the per

kwh recovery of demand costs only partially offsets the reduction in overall recovery of demand costs and results from:

- A customer load factor that is lower with CHP than without CHP, and
- The load-factor block rate form that favors high load factor customers.

### **Recovery of Demand Costs in HECO's Energy Charge**

Historically, the demand charges approved in rate cases have been significantly lower than embedded demand costs, as shown in the approved cost of service study in the rate case. (The customer charges also are lower than embedded customer costs.) Demand costs (and customer costs) that are not recovered through the demand charges (and customer charges) are included in the energy charges, which are set on a cents per kilowatt hour used basis. (Demand costs and customer costs have been referred to as fixed costs.) The illustrative examples address only demand costs.

For example, while the current energy rate for the first energy block of HECO Schedule PS is 7.2087 ¢/kwh, 4.173 ¢/kwh represents the recovery of energy cost (see Attachment 1) and the remaining 3.036¢/kwh represents the recovery of demand cost. Thus, if a customer has a lower kwh usage, the utility's recovery of demand costs from the customer is lower, even if the customer's peak demand is not lower. For Schedule P (and J) customers, this effect is mitigated to a certain extent by the use of a load factor block rate structure. Also, the effect of peak load variations from month-to-month is mitigated somewhat by the demand ratchet feature in Schedules P and J. The load factor block rate structure and the demand ratchet make the calculation of lost fixed cost recovery when a customer reduces its kwh usage through the installation of a CHP system somewhat more complicated.

The term load factor ("LF") refers to the shape of a customer's load profile, i.e., the relationship between the customer's maximum demand (in kw) and the amount of energy

consumed (in kwh). A customer with a high load factor has a relatively flat load profile, while a customer with a low load profile has a high peak, but low kwh consumption. By design, HECO's energy charge recovers more demand cost in the first load factor block than in subsequent load factor blocks. This is because, while all customers have some energy charged in the first block, not all customers will enter the second or third blocks. Thus, more of the demand cost recovery has to be implemented in the early blocks. A low load factor customer will find that relatively more of his energy will fall in the higher cost load factor blocks than a customer with a high load factor. Thus, HECO's load-factor block rate favors high load factor customers with lower energy charges because they can be served more cost-effectively than low load factor customers.

To illustrate the impact of HECO's load-factor blocks on the energy charge consider the following two customers that have the same monthly energy consumption, but different levels of demand:

|            | <u>Monthly<br/>Demand</u> | <u>Monthly<br/>Energy</u> | <u>Calculated Load Factor</u>   |          |
|------------|---------------------------|---------------------------|---|----------|
| Customer A | 100 kw                    | 51,120 kwh                | $\frac{51,120 \text{ kwh}}{100 \text{ kw} \times 30 \text{ days} \times 24 \text{ hr/day}}$ | = 71% LF |
| Customer B | 150 kw                    | 51,120 kwh                | $\frac{51,120 \text{ kwh}}{150 \text{ kw} \times 30 \text{ days} \times 24 \text{ hr/day}}$ | = 47% LF |

As shown in the table below, using the base energy charges set in Docket No. 7766 (HECO's last rate case), the monthly energy charge for the high load factor customer is lower than the energy charge for the low load factor customer. The actual energy charge is the base energy charge plus the Energy Cost Adjustment Factor ("ECAF"). The ECAF adjusts the fuel and purchased energy component of the energy charge for changes in fuel and purchased energy prices. Thus, it does not impact the level of demand costs (or customer costs) included

in the energy charge. As a result, the analysis of demand cost recovery is not affected by the level of the ECAF (which is assumed to be zero for purposes of the illustrative calculations).

**Load Factor Block Recovery of Energy and Demand Costs  
Schedule PS -- Current Rates**

**Energy Charge**

|         |       |            |              |
|---------|-------|------------|--------------|
| Block 1 | First | 200 kwh/kw | 7.2087 ¢/kwh |
| Block 2 | Next  | 200 kwh/kw | 6.4104 ¢/kwh |
| Block 3 | Over  | 400 kwh/kw | 6.1010 ¢/kwh |

**Customer A**

**Load Factor = 71%**

100 kw

51,120 kwh

|         | <u>kwh</u>    | <u>¢/kwh</u> | <u>Mo. Energy<br/>Charge (\$)</u> | <u>Cost Recovery</u>    |                        |
|---------|---------------|--------------|-----------------------------------|-------------------------|------------------------|
|         |               |              |                                   | <u>Energy<br/>Cost*</u> | <u>Demand<br/>Cost</u> |
| Block 1 | 20,000        | 7.2087       | 1,441.74                          | 834.60                  | 607.14                 |
| Block 2 | 20,000        | 6.4104       | 1,282.08                          | 834.60                  | 447.48                 |
| Block 3 | <u>11,120</u> | 6.1010       | <u>678.43</u>                     | <u>464.04</u>           | <u>214.39</u>          |
| total   | 51,120        |              | <b>3,402.25</b>                   | 2,133.24                | 1,269.01               |

**Customer B**

**Load Factor = 47%**

150 kw

51,120 kwh

|         | <u>kwh</u>        | <u>¢/kwh</u> | <u>Mo. Energy<br/>Charge (\$)</u> | <u>Cost Recovery</u>    |                        |
|---------|-------------------|--------------|-----------------------------------|-------------------------|------------------------|
|         |                   |              |                                   | <u>Energy<br/>Cost*</u> | <u>Demand<br/>Cost</u> |
| Block 1 | 30,000            | 7.2087       | 2,162.61                          | 1,251.90                | 910.71                 |
| Block 2 | 21,120            | 6.4104       | 1,353.88                          | 881.34                  | 472.54                 |
| Block 3 | <u>          </u> | 6.1010       | <u>0.00</u>                       | <u>0.00</u>             | <u>0.00</u>            |
| total   | 51,120            |              | <b>3,516.49</b>                   | 2,133.24                | 1,383.25               |

\* Energy cost recovered in energy charge = 4.173 ¢/kwh  
Source: Docket No. 7766 Cost of Service Study (Attach 1)

Note: Assumes Energy Cost Adjustment Factor = 0.000 ¢/kwh

The installation of 3rd Party CHP has the effect of lowering the customer's load factor. The customer's energy purchases from the utility are decreased, while any outage of the CHP unit(s) will create a high demand level that will affect the billing demand for several months due to the demand ratchet. Thus, the amount of demand costs recovered from a 3rd party CHP customer will be affected by the combination of effects resulting from:

- The reduction of energy purchased from the utility,
- The effect of the load-factor block rate form, and
- The effect of the demand ratchet.

The result is a [small] reduction in the recovery of demand costs, even though the customer's peak billing demand in a given month may not be reduced. The exact calculation of lost demand cost recovery when a customer reduces its kwh usage through the installation of a CHP system will be different for each customer, based on the customer's load and usage characteristics before and after the installation of its CHP system, and will vary from month-to-month for individual customers based on variations in the performance characteristics of their CHP systems during the month, and the customers' overall energy usage during the month.

As a result, HECO has picked a representative Schedule P hotel customer that might be a good CHP system candidate, and has done illustrative calculations for a CHP system with a good capacity factor (91%) and a not-as-good capacity factor (80%). The assumptions underlying the calculations are explicitly stated.

#### **Impact of 3<sup>rd</sup> Party CHP on the Recovery of Demand Costs**

To illustrate the impact of 3<sup>rd</sup> party CHP on the recovery of demand costs, consider an example of a generic customer for whom CHP would make economic sense. This customer (see Attachment 2) has the following characteristics:

|                       |         |
|-----------------------|---------|
| Business segment      | Hotel   |
| Rate Schedule         | PS      |
| Peak demand           | 1400 kw |
| Energy Consumption    | 8.7 gwh |
| Load Factor w/out CHP | 71%     |

This customer's CHP system is assumed to have the following characteristics:

|                       |  |
|-----------------------|--|
| CHP capacity          | 500 kw (including the impact of waste heat used for an absorption chiller) |
| CHP capacity factor   | 91%  |
| No. of CHP outages/yr | 4, in different months   |
| CHP energy output     | 4.0 gwh (including the waste heat equivalent)                              |

The customer's monthly load factor with CHP will vary from about 37% to 60% depending on fluctuations in the customer's consumption of energy and whether or not the CHP system has an outage, as shown in Attachment 3. The average monthly load factor is about 47%. The customer's peak billing demand approaches 1400 kW in the 4 months in which its CHP system is assumed to have an outage, and falls to about 1150 kW [i.e.,  $(900 \text{ kW} + 1400 \text{ kW}) \div 2$ , due to the demand ratchet] in the 8 months in which the CHP system does not have an outage. The customer's grid energy consumption is 4.7 gwh, of which 4.3 gwh represents supplemental energy that could not be supplied from the CHP system, and 0.4 gwh [i.e.,  $(500 \text{ kW} \times 8760 \text{ hours/year}) - 4.0 \text{ gwh}$ ] represents backup energy supplied to cover for the 9% of the time that the CHP system is assumed to be out.

The impact on HECO's annual recovery of demand costs, based on current rates, is shown below:



|   | <u>Demand Cost Recovered</u> |                         | <u>kWh</u>       | <u>Avg. Demand Cost in Energy Charge (¢/kwh)</u> |
|---|------------------------------|-------------------------|------------------|--|
|   | <u>Total</u>                 | <u>In Energy Charge</u> | <u>Purchased</u> |  |
| Generic Customer Without CHP <sup>1</sup> | \$ 367,408                   | \$ 212,765              | 8,686,800        | 2.45   |
| Generic Customer With CHP <sup>2</sup>    | \$ 260,330                   | \$ 126,978              | 4,701,000        | 2.70   |
| Difference                                | \$-107,078                   | \$ -85,787              | -3,985,800       |  |

The reduction in the recovery of demand cost is due to:

- Lower demand costs recovered through the energy charge, since the customer with CHP purchases less kwh from the utility,
- Partially offset by an increase in the demand cost recovered per kwh sold to the customer as the result of a lower load factor.

If the number of CHP outages was increased to 12 per year and, as a result, the CHP system capacity factor was lowered to 80%, the impact on the utility's annual recovery of demand costs, based on current rates, would be as shown here and in Attachment 4:

|  | <u>Demand Cost Recovered</u> |                         | <u>kWh</u>       | <u>Avg. Demand Cost in Energy Charge (¢/kwh)</u> |
|--|------------------------------|-------------------------|------------------|--|
|  | <u>Total</u>                 | <u>In Energy Charge</u> | <u>Purchased</u> |  |
| Generic Customer Without CHP           | \$ 367,408                   | \$ 212,765              | 8,686,800        | 2.45   |
| Generic Customer With CHP <sup>3</sup> | \$ 296,091                   | \$ 141,448              | 5,182,800        | 2.73   |
| Difference                             | \$ -71,317                   | \$ -71,317              | -3,504,000       |  |

As can be seen by the comparison of these two scenarios in Attachment 6, the capacity factor of the CHP system has an impact on the amount of demand cost recovered. A CHP system that is less reliable means that the customer has to purchase more energy from the utility and the utility recovers more demand cost.

<sup>1</sup> Attachment 2, p. 2.

<sup>2</sup> Attachment 3, p. 2.

<sup>3</sup> Attachment 4, p. 2.

In summary, when a customer installs a 3<sup>rd</sup> party CHP system, the utility's recovery of its demand costs is reduced. Therefore, in order to make the utility financially whole, the implementation of a standby charge is a reasonable next step.

#### **Extra Standby Charge to Recover Lost Demand Costs**

In order to calculate a stand-alone demand charge, the service to the illustrative customer has to be divided into two separate services – standby service to back up the capacity and energy normally supplied by the customer's own CHP system, and supplemental service to serve the customer's load and energy requirements above the levels normally supplied by the customer's CHP system.

After a customer installs a 3<sup>rd</sup> party CHP system, the utility provides two kinds of service to the customer – standby service to back up the capacity and energy normally supplied by the customer's own CHP system, and supplemental service to serve the customer's load and energy requirements above the levels normally supplied by the customer's CHP system. Under a rate designed to include a standby charge the customer's supplemental service would be billed under its applicable rate schedule, while the standby charge would be applied to the capacity and/or energy provided by the CHP system.

For the illustrative examples, the supplemental service has a billing demand of approximately 900 kw for each month, and total supplemental kwh purchased of 4,306,800, as shown in Attachment 5. The lost demand cost recovery (before adding back any demand costs recovered through the standby demand charge applied to the backup service for the 500 kw normally served by the customer's CHP system) is calculated as follows (and is shown in Attachment 5):

|  | <u>Demand Cost Recovered</u> |                         | <u>kWh</u>       | <u>Avg. Demand</u>    |
|--|------------------------------|-------------------------|------------------|-----------------------|
|  | <u>Total</u>                 | <u>In Energy Charge</u> | <u>Purchased</u> | <u>Cost in Energy</u> |
|  |                              |                         |                  | <u>Charge (¢/kwh)</u> |
| Generic Customer Without CHP           | \$ 367,408                   | \$ 212,765              | 8,686,800        | 2.45                  |
| Generic Customer With CHP <sup>4</sup> | \$ 208,794                   | \$ 111,152              | 4,306,800        | 2.29                  |
| Difference                             | \$-158,614                   | \$-101,613              | -4,380,000       |                       |

Under this scenario, the characteristics of the customer's remaining load (1400 kw less 500 kw CHP net capacity = 900 kw) represent the supplemental service supplied by the utility. The standby service provided by the utility backs up the capacity and energy normally supplied by the customer's own CHP system (500 kw) when the CHP system does not operate at a 100% capacity factor. Thus, the total demand cost recovered by utility through the supplemental service provided to this generic customer with CHP totals \$208,794, which is \$158,614 less than what would have been recovered had the customer not installed the CHP system.

One possible mechanism to recover demand costs through a standby demand charge would be to include a monthly \$/kw standby charge that would be applied to the kw standby demand, i.e., the demand normally supplied by the CHP system. As shown above and in Attachment 6, Scenario D, the difference in total annual demand charges recovered between the customer without CHP and the customer's supplemental service is \$158,614. Thus, the reservations charge would be equal to \$26.44/kw/mo ( $= \$158,614 \div 500 \text{ kw} \div 12 \text{ mos}$ ). At \$26.44/kw/mo, the utility would recover 100% of the annual difference in its recovery of demand cost. The standby charge at different recovery percentages would be as follows:

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<sup>4</sup> Attachment 5, p. 2.

| <u>% Lost Demand<br/>Charge Recovered</u> | <u>Monthly Standby<br/>Charge (\$/kw standby)</u> | <u>Annual<br/>Demand Cost<br/>Recovery Through<br/>Standby Charge</u> |
|---|---|---|
| 30%                                       | 7.93  | \$ 47,580   |
| 60%                                       | 15.86   | \$ 95,160   |
| 100%                                      | 26.44   | \$158,614   |

Moreover, since the standby charge would be designed to recover the "appropriate" difference in demand costs, the base energy charge applied to the standby service would not include a demand charge component. Thus, the base energy charge would be 4.173¢/kwh. (The actual energy charge would include the Energy Cost Adjustment Factor, which for this discussion has been assumed to be zero.)

A second alternative to recover demand costs is to add an additional standby charge on a ¢/kwh basis that is applied to the kwh consumption over and above the 4.3 gwh of supplemental energy (i.e., to the backup energy). The amount of backup energy supplied from the grid would depend on the CHP system's capacity factor. For a 500 kw system with a 91% capacity factor, the amount of backup energy would be 394,200 kwh [500 kw x 8760 hours/yr x (1 - 0.91)]. For a 500 kwh system with an 80% capacity factor, the amount of backup energy would be 876,000 kwh [500 kw x 8760 hours/yr x (1 - 0.20)].

In other words, instead of charging 4.173 ¢/kwh (plus the ECAF) for backup energy, the backup energy rate would be increased by some amount. If the adder was 3.0 ¢/kwh, the additional demand cost recovery would be \$11,826 (\$0.03/kwh x 394,200 kwh) for the 91% capacity factor CHP system, and \$26,280 (\$0.03/kwh x 876,000 kwh) for the 80% capacity factor CHP system.

The total demand cost recovery for the backup service (assuming a \$7.93/kw monthly standby charge applied to the 500 kw, as in the prior illustration, and a 3.0 ¢/kwh adder applied to backup energy) would then be as follows for a 91% capacity factor CHP system:

Standby Charge (\$)

|                                    |                 |
|------------------------------------|-----------------|
| Reservations charge <sup>5</sup>   | \$47,580        |
| Standby energy charge <sup>6</sup> | <u>\$11,826</u> |
| Total demand cost recovered        | \$59,406        |

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<sup>5</sup> \$7.93/kw x 500 kw x 12 months

<sup>6</sup> \$0.03/kwh x (1-0.91) x 500 kw x 8760 hrs/yr

HAWAIIAN ELECTRIC COMPANY  
TEST YEAR 1995, DOCKET NO. 7766

UNIT FUNCTIONALIZED CLASS SALES REVENUES AT PROPOSED RATES - Phase 2

Source of Energy  
Cost # Current  
Rates

|                         |            | RESIDENTIAL<br>SERVICE<br>R | GEN SVY<br>NON-DEMD<br>G | GEN SVY<br>DEMAND<br>J | COMMERCIAL<br>SERVICE<br>H | LARGE<br>POWER<br>P | STREET<br>LIGHTING<br>F | TOTAL<br>SYSTEM |
|-------------------------|------------|-----------------------------|--------------------------|------------------------|----------------------------|---------------------|-------------------------|-----------------|
| ENERGY                  | UNITS      |                             |                          |                        |                            |                     |                         |                 |
| *****                   | -----      |                             |                          |                        |                            |                     |                         |                 |
| PRODUCTION              | [/KWH      | 4.258                       | 4.283                    | 4.278                  | 4.267                      | 4.173               | 4.233                   | 4.224           |
| DEMAND                  |            |                             |                          |                        |                            |                     |                         |                 |
| *****                   | -----      |                             |                          |                        |                            |                     |                         |                 |
| PRODUCTION              | \$/KWH/MO  | 6.08                        | 11.73                    | 11.27                  | 13.89                      | 14.01               | 13.82                   | 9.61            |
| TRANSMISSION            | \$/KWH/MO  | 1.08                        | 3.38                     | 3.39                   | 3.02                       | 3.33                | 2.82                    | 2.29            |
| DISTRIBUTION PRIMARY    |            |                             |                          |                        |                            |                     |                         |                 |
| *****                   | -----      |                             |                          |                        |                            |                     |                         |                 |
| SUBSTATIONS             | \$/KWH/MO  | .31                         | .88                      | .88                    | .84                        | .82                 | .80                     | .58             |
| PRIMARY LINES           | \$/KWH/MO  | .39                         | 1.03                     | .99                    | 1.02                       | .97                 | .98                     | .70             |
| PRIMARY DEMAND          | \$/KWH/MO  | .70                         | 1.91                     | 1.84                   | 1.87                       | 1.79                | 1.77                    | 1.28            |
| DISTRIBUTION SECONDARY  |            |                             |                          |                        |                            |                     |                         |                 |
| *****                   | -----      |                             |                          |                        |                            |                     |                         |                 |
| SECONDARY LINES         | \$/KWH/MO  | .22                         | .46                      | .43                    | .41                        | .11                 | .24                     | .24             |
| LINE TRANSFORMERS       | \$/KWH/MO  | .23                         | .55                      | .51                    | .45                        | .13                 | .25                     | .27             |
| SECONDARY DEMAND        | \$/KWH/MO  | .46                         | 1.01                     | .93                    | .86                        | .24                 | .49                     | .51             |
| DISTRIBUTION DEMAND     | \$/KWH/MO  | 1.16                        | 2.92                     | 2.77                   | 2.73                       | 2.03                | 2.27                    | 1.79            |
| TOTAL DEMAND            | \$/KWH/MO  | 8.32                        | 18.03                    | 17.44                  | 19.64                      | 19.58               | 18.90                   | 13.58           |
| TOTAL DEMAND AND ENERGY | [/KWH      | 10.193                      | 10.687                   | 10.016                 | 10.601                     | 8.557               | 10.379                  | 9.437           |
| CUSTOMER                |            |                             |                          |                        |                            |                     |                         |                 |
| *****                   | -----      |                             |                          |                        |                            |                     |                         |                 |
| PRIMARY LINES           | \$/CUST/MO | 4.11                        | 8.57                     | 12.94                  | 8.15                       | 11.24               | 4.64                    | 4.73            |
| SECONDARY LINES         | \$/CUST/MO | 2.73                        | 4.81                     | 5.78                   | 3.99                       | .00                 | .00                     | 2.97            |
| LINE TRANSFORMERS       | \$/CUST/MO | .50                         | 9.84                     | 25.58                  | 12.45                      | 27.61               | .00                     | 2.01            |
| SERVICES                | \$/CUST/MO | 1.18                        | 1.87                     | 3.85                   | 1.59                       | 7.00                | 2.76                    | 1.31            |
| METERS                  | \$/CUST/MO | .93                         | 2.27                     | 5.85                   | 6.64                       | 45.50               | 10.35                   | 1.32            |
| STREET LIGHTING         | \$/CUST/MO | .00                         | .00                      | .00                    | .00                        | .00                 | .00                     | .00             |
| CUSTOMER ACCOUNTS       | \$/CUST/MO | 3.51                        | 4.16                     | 6.04                   | 4.61                       | 7.16                | 3.74                    | 3.63            |
| UNCOLLECTIBLES          | \$/CUST/MO | .27                         | .59                      | 1.29                   | 1.48                       | .00                 | .00                     | .33             |
| CUSTOMER SERVICE        | \$/CUST/MO | .90                         | .68                      | 10.17                  | 4.49                       | 297.08              | .39                     | 1.60            |
| TOTAL CUSTOMER          | \$/CUST/MO | 14.12                       | 32.80                    | 71.47                  | 43.39                      | 395.60              | 21.87                   | 17.91           |
| TOTAL                   | [/KWH      | 12.398                      | 13.785                   | 10.358                 | 11.449                     | 8.623               | 10.603                  | 10.286          |

LOADING FACTORS

|                          |          |           |         |           |         |           |        |           |
|--------------------------|----------|-----------|---------|-----------|---------|-----------|--------|-----------|
| *****                    | -----    |           |         |           |         |           |        |           |
| ENERGY SALES             | MWH      | 1,783,100 | 282,300 | 1,301,500 | 283,000 | 3,124,100 | 38,900 | 6,812,900 |
| SUM OF CUSTOMER DEMANDS  | MW (M-C) | 12,630.0  | 1,002.7 | 4,282.7   | 912.9   | 6,998.2   | 126.5  | 25,950.9  |
| AVERAGE ANNUAL CUSTOMERS | NUMBER   | 236,324   | 22,226  | 5,193     | 4,718   | 436       | 332    | 269,229   |

1 2 2a 3 4 5 6 7 8

| ENE COST         |     | GENERIC HOTEL PROFILE (71% LOAD FACTOR) |          |       |  |          |                |                                     |
|------------------|-----|---|----------|-------|--|----------|----------------|-------------------------------------|
| \$0.04173 \$/KwH |     | 2004 PROFILE                            |          | Mo LF | 2004 BILLING INFORMATION (calculated using proposed rates) |          |                |                                     |
|                  |     | KWH                                     | BILL KWH |       | CUST CHG   | ENE CHG  | ENE IN ENE CHG | DMD IN ENE CHG DMD CHG TOTAL DMD \$ |
| DAYS             |     |   |          |       |  |          |                |                                     |
| Jan-04           | 31  | 778,800                                 | 1,308.0  | 80.0% | \$320  | \$51,222 | \$32,495       | \$18,726 \$12,676 \$31,402          |
| Feb-04           | 28  | 672,000                                 | 1,330.8  | 75.1% | \$320  | \$44,770 | \$28,039       | \$16,731 \$12,893 \$29,624          |
| Mar-04           | 31  | 672,000                                 | 1,257.0  | 71.9% | \$320  | \$44,561 | \$28,039       | \$16,522 \$12,192 \$28,714          |
| Apr-04           | 30  | 669,600                                 | 1,249.2  | 74.4% | \$320  | \$44,393 | \$27,939       | \$16,454 \$12,117 \$28,571          |
| May-04           | 31  | 642,000                                 | 1,249.8  | 69.0% | \$320  | \$42,711 | \$26,787       | \$15,923 \$12,123 \$28,046          |
| Jun-04           | 30  | 741,600                                 | 1,301.4  | 79.1% | \$320  | \$48,933 | \$30,943       | \$17,990 \$12,613 \$30,603          |
| Jul-04           | 31  | 739,200                                 | 1,329.0  | 74.8% | \$320  | \$48,865 | \$30,843       | \$18,022 \$12,876 \$30,898          |
| Aug-04           | 31  | 745,200                                 | 1,372.8  | 73.0% | \$320  | \$49,434 | \$31,094       | \$18,340 \$13,554 \$31,894          |
| Sep-04           | 30  | 844,800                                 | 1,375.8  | 85.3% | \$320  | \$55,441 | \$35,249       | \$20,191 \$13,320 \$33,511          |
| Oct-04           | 31  | 735,600                                 | 1,399.8  | 70.6% | \$320  | \$48,846 | \$30,693       | \$18,153 \$13,548 \$31,701          |
| Nov-04           | 30  | 739,200                                 | 1,392.6  | 73.7% | \$320  | \$49,045 | \$30,843       | \$18,202 \$13,480 \$31,682          |
| Dec-04           | 31  | 706,800                                 | 1,368.6  | 69.4% | \$320  | \$47,001 | \$29,491       | \$17,509 \$13,252 \$30,761          |
| TOTAL            | 365 | 8,686,800                               | 1,399.8  | 70.8% | 3,840  | 575,222  | 362,457        | 212,765 154,643 367,408             |
|                  |     | Ave Monthly LF =                        |          | 74.4% |  |          |                |                                     |

- Generic HECO hotel KWH.
- Generic HECO hotel billing Kw.
- HECO customer charge for "p" class "Large Power"
- Calculated using proposed rates
- Using 2005 cost of service study, we calculated the cents/KwH in energy charge related to energy based on unit functionalized class sales revenues and functionalized class sales revenues "Phase 2". We then multiplied this amount by column 1 to get the actual cost of energy.
- By subtracting column 5 from column 4 we get the demand charge embedded in the energy charge.
- Calculated demand charge
- By adding columns 6 and 7 we get the total demand related \$.

| GENERIC HOTEL WITHOUT CHP                   |                         |               |           |
|---|-------------------------|---------------|-----------|
|   | FULL YEAR               |               |           |
|   | 1                       | Cus.Chg       | \$3,840   |
|   | 2                       | Demand Charge | \$154,643 |
|   | 3                       | Energy Charge | \$575,222 |
|   | 3a                      | ENE Related   | \$362,457 |
|   | 3b                      | DMD Related   | \$212,765 |
|   | Total Related to Demand |               | \$367,408 |
|   | TOTAL                   |               | \$733,705 |
| Customer Charge                             |                         |               | \$320.00  |
| Demand Charges                              | First                   | 500           | \$10.00   |
|   | Next                    | 1000          | \$9.50    |
|   | Over                    | 1500          | \$8.50    |
| Energy Charges                              | First                   | 200           | \$0.072   |
|   | Next                    | 200           | \$0.064   |
|   | Over                    | 400           | \$0.061   |
| Energy Cost / kWh (see Generic CHP Profile) |                         |               | \$0.042   |
|   | MONTH                   | Kw            | KwH       |
|   | Jan-04                  | 1,308         | 778,800   |
|   | Feb-04                  | 1,331         | 672,000   |
|   | Mar-04                  | 1,257         | 672,000   |
|   | Apr-04                  | 1,249         | 669,600   |
|   | May-04                  | 1,250         | 642,000   |
|   | Jun-04                  | 1,301         | 741,600   |
|   | Jul-04                  | 1,329         | 739,200   |
|   | Aug-04                  | 1,400         | 745,200   |
|   | Sep-04                  | 1,376         | 844,800   |
|   | Oct-04                  | 1,400         | 735,600   |
|   | Nov-04                  | 1,393         | 739,200   |
|   | Dec-04                  | 1,369         | 706,800   |
|   |                         |               | 8,686,800 |



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| GENERIC HOTEL PROFILE: |      |           |         | SCENARIO B |              |   |           |           |         |
|------------------------|------|-----------|---------|------------|--------------|---|-----------|-----------|---------|
| MONTH                  | DAYS | KWH       | MEAS KW | BILL KW    | TOTAL DMD \$ | RESIDUAL GENERIC HOTEL PROFILE WITH CHIP OUTPUT REMOVED |           |           |         |
|                        |      |           |         |            |              | KW - AVAIL - 500 91% # OUTAGES - 4                      | CHP KW    | CHP KWH   | MEAS KW |
| Mar-03                 | 31   | 650,400   | 1,168.8 | 1,308.0    | \$31,402     | 0   | 0         | 1,169     | 770.8   |
| Apr-03                 | 30   | 718,800   | 1,180.8 | 1,330.8    | \$29,624     | 500   | 500       | 681       | 816.4   |
| May-03                 | 31   | 639,600   | 1,126.8 | 1,257.0    | \$28,714     | 500   | 500       | 627       | 1,168.8 |
| Jun-03                 | 30   | 747,600   | 1,296.0 | 1,249.2    | \$28,571     | 0   | 0         | 1,296     | 653.2   |
| Jul-03                 | 31   | 840,000   | 1,320.0 | 1,249.8    | \$28,046     | 500   | 500       | 820       | 654.4   |
| Aug-03                 | 31   | 794,400   | 1,340.4 | 1,301.4    | \$30,603     | 500   | 500       | 840       | 1,257.6 |
| Sep-03                 | 30   | 778,800   | 1,316.4 | 1,329.0    | \$30,898     | 0   | 0         | 1,316     | 812.8   |
| Oct-03                 | 31   | 849,600   | 1,345.2 | 1,375.8    | \$33,511     | 500   | 500       | 845       | 900.4   |
| Nov-03                 | 30   | 756,000   | 1,327.2 | 1,399.8    | \$31,701     | 500   | 500       | 827       | 1,351.2 |
| Dec-03                 | 31   | 748,800   | 1,298.4 | 1,392.6    | \$31,682     | 500   | 500       | 827       | 884.8   |
| Jan-04                 | 31   | 778,800   | 1,270.8 | 1,368.6    | \$30,761     | 0   | 0         | 1,298     | 1,336.8 |
| Feb-04                 | 28   | 672,000   | 1,316.4 | 1,400.4    | \$30,761     | 500   | 500       | 770.8     | 433.350 |
| Mar-04                 | 31   | 672,000   | 1,168.8 | 1,257.0    | \$28,714     | 500   | 500       | 816.4     | 471.1   |
| Apr-04                 | 30   | 669,600   | 1,153.2 | 1,249.2    | \$28,571     | 0   | 0         | 1,168.8   | 43.3%   |
| May-04                 | 31   | 642,000   | 1,154.4 | 1,249.8    | \$28,046     | 500   | 500       | 653.2     | 46.7%   |
| Jun-04                 | 30   | 741,600   | 1,257.6 | 1,301.4    | \$30,603     | 500   | 500       | 984.8     | 51.8%   |
| Jul-04                 | 31   | 739,200   | 1,312.8 | 1,329.0    | \$30,898     | 500   | 500       | 985.4     | 46.4%   |
| Aug-04                 | 31   | 745,200   | 1,400.4 | 1,400.4    | \$31,894     | 500   | 500       | 1,064.6   | 45.3%   |
| Sep-04                 | 30   | 844,800   | 1,351.2 | 1,375.8    | \$33,511     | - 0   | 0         | 1,108.4   | 60.0%   |
| Oct-04                 | 31   | 735,600   | 1,399.2 | 1,399.8    | \$31,701     | 500   | 500       | 1,351.2   | 43.4%   |
| Nov-04                 | 30   | 739,200   | 1,384.8 | 1,392.6    | \$31,682     | 500   | 500       | 1,125.2   | 47.1%   |
| Dec-04                 | 31   | 706,800   | 1,336.8 | 1,368.6    | \$30,761     | 0   | 0         | 1,118.0   | 43.3%   |
| TOTAL                  | 365  | 8,686,800 | 1,400.4 | 1,400.4    | \$30,761     | 3,985,800   | 3,985,800 | 4,701,000 | 260,330 |

Difference from original DMD \$ 46.7%

Average Monthly LF =

- 1 Generic HECCO hotel KWH.
- 2 Generic HECCO hotel measured Kw.
- 3 Generic HECCO hotel billing Kw.
- 4 Total DMD related \$
- 5 Kw to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile. It is equal to the Kw of the CHP unit except in months where there is an outage in which case it is equal to 0.
- 6 KWH to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile.
- 7 Residual CHP profile Measured Kw. Calculated by subtracting column 5 from column 2
- 8 Residual CHP profile Billing Kw. Calculated by taking the greater of the current months measured Kw and the average of the current month measured Kw at the maximum of the last 11 months measured Kw.
- 9 Residual CHP profile KWH. Calculated by subtracting column 6 from column 1
- 10 Total DMD related \$ for this scenario after running the new profile through the HECCO rates.

| SCENARIO B                                  |               |         |           |
|---|---------------|---------|-----------|
|   | FULL YEAR     |         |           |
| 1   | Cus Chg       |         | \$3,840   |
| 2   | Demand Charge |         | \$133,351 |
| 3   | Energy Charge |         | \$323,128 |
| 3a  | ENE Related   |         | \$196,149 |
| 3b  | DMD Related   |         | \$126,978 |
| Total Related to Demand                     |               |         | \$260,330 |
| TOTAL                                       |               |         | \$460,319 |
| Customer Charge                             |               |         | \$320.00  |
| Demand Charges                              | First 500     |         | \$10.00   |
|   | Next 1000     |         | \$9.50    |
|   | Over 1500     |         | \$8.50    |
| Energy Charges                              | First 200     |         | \$0.072   |
|   | Next 200      |         | \$0.064   |
|   | Over 400      |         | \$0.061   |
| Energy Cost / Kwh (see Generic CHP Profile) |               |         | \$0.042   |
| MONTH                                       | Kw            | Kwh     |           |
| Jan-04                                      | 1,044         | 406,800 |           |
| Feb-04                                      | 1,066         | 336,000 |           |
| Mar-04                                      | 1,243         | 398,550 |           |
| Apr-04                                      | 985           | 309,600 |           |
| May-04                                      | 985           | 270,000 |           |
| Jun-04                                      | 1,287         | 480,150 |           |
| Jul-04                                      | 1,065         | 367,200 |           |
| Aug-04                                      | 1,108         | 373,200 |           |
| Sep-04                                      | 1,351         | 583,350 |           |
| Oct-04                                      | 1,125         | 363,600 |           |
| Nov-04                                      | 1,118         | 379,200 |           |
| Dec-04                                      | 1,344         | 433,350 |           |
|   |               |         | 4,701,000 |

| 1                               | 2                        | 3         | 4       | 5                        | 6            | 7  | 8         | 9       | 9a      | 10        |       |              |
|---------------------------------|--------------------------|-----------|---------|--------------------------|--------------|--|-----------|---------|---------|-----------|-------|--------------|
| GENERIC HOTEL PROFILE           |                          |           |         | SCENARIO C               |              |  |           |         |         |           |       |              |
|                                 |                          |           |         | KW - AVAIL - # OUTAGES - | 500 80% 12   | RESIDUAL GENERIC HOTEL PROFILE WITH CHP OUTPUT REMOVED |           |         |         |           |       |              |
| MONTH                           | DAYS                     | KW/H      | MEAS KW | BILL KW                  | TOTAL DMD \$ | CHP KW   | CHP KWH   | MEAS KW | BILL KW | RESID KWH | Mo LF | TOTAL DMD \$ |
| Mar-03                          |                          | 650,400   | 1,168.8 |                          |              | 0  |           | 1,168.8 |         |           |       |              |
| Apr-03                          |                          | 718,800   | 1,180.8 |                          |              | 0  |           | 1,180.8 |         |           |       |              |
| May-03                          |                          | 639,600   | 1,126.8 |                          |              | 0  |           | 1,126.8 |         |           |       |              |
| Jun-03                          |                          | 747,600   | 1,296.0 |                          |              | 0  |           | 1,296.0 |         |           |       |              |
| Jul-03                          |                          | 840,000   | 1,320.0 |                          |              | 0  |           | 1,320.0 |         |           |       |              |
| Aug-03                          |                          | 794,400   | 1,340.4 |                          |              | 0  |           | 1,340.4 |         |           |       |              |
| Sep-03                          |                          | 778,800   | 1,316.4 |                          |              | 0  |           | 1,316.4 |         |           |       |              |
| Oct-03                          |                          | 849,600   | 1,345.2 |                          |              | 0  |           | 1,345.2 |         |           |       |              |
| Nov-03                          |                          | 756,000   | 1,327.2 |                          |              | 0  |           | 1,327.2 |         |           |       |              |
| Dec-03                          |                          | 748,800   | 1,298.4 |                          |              | 0  |           | 1,298.4 |         |           |       |              |
| Jan-04                          | 31                       | 778,800   | 1,270.8 | 1,308.0                  | \$31,402     | 0  | 299,000   | 1,270.8 | 1,308.0 | 479,800   | 49.3% | \$25,502     |
| Feb-04                          | 28                       | 672,000   | 1,316.4 | 1,330.8                  | \$29,624     | 0  | 263,000   | 1,316.4 | 1,330.8 | 409,000   | 45.7% | \$24,170     |
| Mar-04                          | 31                       | 672,000   | 1,168.8 | 1,257.0                  | \$28,714     | 0  | 299,000   | 1,168.8 | 1,257.0 | 373,000   | 39.9% | \$22,546     |
| Apr-04                          | 30                       | 669,600   | 1,153.2 | 1,249.2                  | \$28,571     | 0  | 287,000   | 1,153.2 | 1,249.2 | 382,600   | 42.5% | \$22,674     |
| May-04                          | 31                       | 642,000   | 1,154.4 | 1,249.8                  | \$28,046     | 0  | 299,000   | 1,154.4 | 1,249.8 | 343,000   | 36.9% | \$21,795     |
| Jun-04                          | 30                       | 741,600   | 1,257.6 | 1,301.4                  | \$30,603     | 0  | 287,000   | 1,257.6 | 1,301.4 | 454,600   | 48.5% | \$24,865     |
| Jul-04                          | 31                       | 739,200   | 1,312.8 | 1,329.0                  | \$30,898     | 0  | 299,000   | 1,312.8 | 1,329.0 | 440,200   | 44.5% | \$24,849     |
| Aug-04                          | 31                       | 745,200   | 1,400.4 | 1,400.4                  | \$31,894     | 0  | 299,000   | 1,400.4 | 1,400.4 | 446,200   | 42.8% | \$25,775     |
| Sep-04                          | 30                       | 844,800   | 1,351.2 | 1,375.8                  | \$33,511     | 0  | 287,000   | 1,351.2 | 1,375.8 | 557,800   | 56.3% | \$27,977     |
| Oct-04                          | 31                       | 735,600   | 1,399.2 | 1,399.8                  | \$31,701     | 0  | 299,000   | 1,399.2 | 1,399.8 | 436,600   | 41.9% | \$25,554     |
| Nov-04                          | 30                       | 739,200   | 1,384.8 | 1,392.6                  | \$31,682     | 0  | 287,000   | 1,384.8 | 1,392.6 | 452,200   | 45.1% | \$25,823     |
| Dec-04                          | 31                       | 706,800   | 1,336.8 | 1,368.6                  | \$30,761     | 0  | 299,000   | 1,336.8 | 1,368.6 | 407,800   | 40.0% | \$24,563     |
| TOTAL                           | 365                      | 8,686,800 |         | 1,400.4                  | 367,408      | 0  | 3,504,000 |         |         | 5,182,800 |       | 296,091      |
| Difference from original DMD \$ |                          |           |         |                          |              |  |           |         |         |           |       | (\$71,317)   |
| Average Monthly LF =            |                          |           |         |                          |              |  |           |         |         |           |       | 44.5%        |
| 1                               | Generic HECCO hotel Kw/H |           |         |                          |              |  |           |         |         |           |       |              |

1 Generic HECO hotel Kw/H.

2 Generic HECO hotel measured Kw.

3 Generic HECO hotel billing Kw.

4 Total DMD related \$

5 Kw to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile. It is equal to the Kw of the CHP unit except in months where there is an outage in which case it is equal to 0.

6 Kw/H to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile.

7 Residual CHP profile Measured Kw. Calculated by subtracting column 5 from column 2

8 Residual CHP profile Billing Kw. Calculated by taking the greater of the current months measured Kw and the average of the current month measured Kw an the maximum of the last 11 months measured Kw.

9 Residual CHP profile Kw/H. Calculated by subtracting column 6 from column 1

10 Total DMD related \$ for this scenario after running the new profile through the HECO rates.

att4 - curr rates 80% chp.xls

| SCENARIO C                                  |               |           |           |
|---|---------------|-----------|-----------|
|   |               | FULL YEAR |           |
|   |               | Cus.Chg   | \$3,840   |
| 1   |               |           |           |
| 2   | Demand Charge |           | \$154,643 |
| 3   | Energy Charge |           | \$357,701 |
| 3a  | ENE Related   |           | \$216,253 |
| 3b  | DMD Related   |           | \$141,448 |
| Total Related to Demand                     |               |           | \$296,091 |
| TOTAL                                       |               |           | \$516,183 |
| Customer Charge                             |               |           |           |
| Demand Charges                              |               |           |           |
|   | First         | 500       | \$320.00  |
|   | Next          | 1000      | \$10.00   |
|   | Over          | 1500      | \$9.50    |
| Energy Charges                              |               |           |           |
|   | First         | 200       | \$8.50    |
|   | Next          | 200       | \$0.072   |
|   | Over          | 200       | \$0.064   |
|   | Over          | 400       | \$0.061   |
| Energy Cost / kWh (see Generic CHP Profile) |               |           |           |
| MONTH                                       | Kw            | Kwh       |           |
| Jan-04                                      | 1,308         | 479,800   |           |
| Feb-04                                      | 1,331         | 409,000   |           |
| Mar-04                                      | 1,257         | 373,000   |           |
| Apr-04                                      | 1,249         | 382,600   |           |
| May-04                                      | 1,250         | 343,000   |           |
| Jun-04                                      | 1,301         | 454,600   |           |
| Jul-04                                      | 1,329         | 440,200   |           |
| Aug-04                                      | 1,400         | 446,200   |           |
| Sep-04                                      | 1,376         | 557,800   |           |
| Oct-04                                      | 1,400         | 436,600   |           |
| Nov-04                                      | 1,393         | 452,200   |           |
| Dec-04                                      | 1,369         | 407,800   |           |
|   |               |           | 5,182,800 |

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| GENERIC HOTEL PROFILE |      |           |         | SUPPLEMENTAL SERVICE |              |                               |           |         |  |
|-----------------------|------|-----------|---------|----------------------|--------------|-------------------------------|-----------|---------|--|
| MONTH                 | DAYS | KWH       | MEAS KW | BILL KW              | TOTAL DMD \$ | KW - AVAIL - 100% OUTAGES - 0 | CHP KW    | CHP KWH | RESIDUAL GENERIC HOTEL PROFILE WITH CHP OUTPUT REMOVED |
| Mar-03                |      | 650,400   | 1,168.8 |                      |              | 500                           |           |         |  |
| Apr-03                |      | 718,800   | 1,180.8 |                      |              | 500                           |           |         |  |
| May-03                |      | 639,600   | 1,126.8 |                      |              | 500                           |           |         |  |
| Jun-03                |      | 747,600   | 1,296.0 |                      |              | 500                           |           |         |  |
| Jul-03                |      | 840,000   | 1,320.0 |                      |              | 500                           |           |         |  |
| Aug-03                |      | 794,400   | 1,340.4 |                      |              | 500                           |           |         |  |
| Sep-03                |      | 778,800   | 1,316.4 |                      |              | 500                           |           |         |  |
| Oct-03                |      | 849,600   | 1,345.2 |                      |              | 500                           |           |         |  |
| Nov-03                |      | 756,000   | 1,327.2 |                      |              | 500                           |           |         |  |
| Dec-03                |      | 748,800   | 1,298.4 |                      |              | 500                           |           |         |  |
| Jan-04                | 31   | 778,800   | 1,270.8 | 1,308.0              | \$31,402     | 500                           | 372,000   |         | 808.0  |
| Feb-04                | 28   | 672,000   | 1,316.4 | 1,330.8              | \$29,624     | 500                           | 336,000   |         | 830.8  |
| Mar-04                | 31   | 672,000   | 1,168.8 | 1,257.0              | \$28,714     | 500                           | 372,000   |         | 757.0  |
| Apr-04                | 30   | 669,600   | 1,153.2 | 1,249.2              | \$28,571     | 500                           | 360,000   |         | 749.2  |
| May-04                | 31   | 642,000   | 1,154.4 | 1,249.8              | \$28,046     | 500                           | 372,000   |         | 757.6  |
| Jun-04                | 30   | 741,600   | 1,257.6 | 1,301.4              | \$30,603     | 500                           | 360,000   |         | 801.4  |
| Jul-04                | 31   | 739,200   | 1,312.8 | 1,329.0              | \$30,898     | 500                           | 372,000   |         | 829.0  |
| Aug-04                | 31   | 745,200   | 1,400.4 | 1,400.4              | \$31,894     | 500                           | 372,000   |         | 900.4  |
| Sep-04                | 30   | 844,800   | 1,351.2 | 1,375.8              | \$33,511     | 500                           | 360,000   |         | 851.2  |
| Oct-04                | 31   | 735,600   | 1,399.2 | 1,399.8              | \$31,701     | 500                           | 372,000   |         | 899.2  |
| Nov-04                | 30   | 739,200   | 1,384.8 | 1,392.6              | \$31,682     | 500                           | 360,000   |         | 884.8  |
| Dec-04                | 31   | 706,800   | 1,336.8 | 1,368.6              | \$30,761     | 500                           | 372,000   |         | 836.8  |
| TOTAL                 | 365  | 8,686,800 |         | 1,400.4              |              | 6,000                         | 4,380,000 |         |  |

Difference from original DMD \$ 4,306,800  
Average Monthly LF = 59.2%

- Generic HECO hotel KwH.
- Generic HECO hotel measured Kw.
- Generic HECO hotel billing Kw.
- Total DMD related \$
- Kw to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile. It is equal to the Kw of the CHP unit except in months where there is an outage in which case it is equal to 0.
- KwH to be subtracted from the generic hotel profile measured Kw to determine the residual CHP profile.
- Residual CHP profile Measured Kw. Calculated by subtracting column 5 from column 2
- Residual CHP profile Billing Kw. Calculated by taking the greater of the current months measured Kw and the average of the current month measured Kw on the maximum of the last 11 months measured Kw.
- Residual CHP profile KwH. Calculated by subtracting column 6 from column 1
- Total DMD related \$ for this scenario after running the new profile through the HECO rates.

att5 - curr rates 100% chp.xls

| SCENARIO D - SUPPLEMENTAL SERVICE           |                         |               |                  |                  |
|---|-------------------------|---------------|------------------|------------------|
|   | FULL YEAR               |               |                  |                  |
|   | 1                       | Cus.Chg       |                  | \$3,840          |
|   | 2                       | Demand Charge |                  | \$97,643         |
|   | 3                       | Energy Charge |                  | \$290,853        |
|   | 3a                      | ENE Related   |                  | \$179,701        |
|   | 3b                      | DMD Related   |                  | \$111,152        |
|   | Total Related to Demand |               |                  | \$208,794        |
| <b>TOTAL</b>                                |                         |               |                  | <b>\$392,336</b> |
| Customer Charge                             |                         |               |                  | \$320.00         |
| Demand Charges                              | First                   | 500           |                  | \$10.00          |
|   | Next                    | 1000          |                  | \$9.50           |
|   | Over                    | 1500          |                  | \$8.50           |
| Energy Charges                              | First                   | 200           |                  | \$0.072          |
|   | Next                    | 200           |                  | \$0.064          |
|   | Over                    | 400           |                  | \$0.061          |
| Energy Cost / KwH (see Generic CHP Profile) |                         |               |                  | \$0.042          |
|   | MONTH                   | Kw            | KwH              |                  |
|   | Jan-04                  | 808           | 406,800          |                  |
|   | Feb-04                  | 831           | 336,000          |                  |
|   | Mar-04                  | 757           | 300,000          |                  |
|   | Apr-04                  | 749           | 309,600          |                  |
|   | May-04                  | 750           | 270,000          |                  |
|   | Jun-04                  | 801           | 381,600          |                  |
|   | Jul-04                  | 829           | 367,200          |                  |
|   | Aug-04                  | 900           | 373,200          |                  |
|   | Sep-04                  | 876           | 484,800          |                  |
|   | Oct-04                  | 900           | 363,600          |                  |
|   | Nov-04                  | 893           | 379,200          |                  |
|   | Dec-04                  | 869           | 334,800          |                  |
|   |                         |               | <b>4,306,800</b> |                  |

ANNUAL CUSTOMER BILL BY COMPONENT -- CURRENT RATES

|   | CUS CHARGE | DMD CHARGE | DMD RELATED | ENE CHARGE | ENE RELATED | TOTAL BILL | TOTAL DMD \$ |
|---|------------|------------|-------------|------------|-------------|------------|--------------|
| <b>SCENARIO A</b>                               |            |            |             |            |             |            |              |
| HOTEL WITH GENERIC LOAD PROFILE                 | \$3,840    | \$154,643  | \$212,765   | \$362,457  |             | \$733,705  | \$367,408    |
| <b>SCENARIO B</b>                               |            |            |             |            |             |            |              |
| 500 kw CHP, 91% avail, 4 outages, with ratchet  | \$3,840    | \$133,351  | \$126,978   | \$196,149  |             | \$460,319  | \$260,330    |
| SCENARIO B LESS SCENARIO A                      |            |            |             |            |             |            | -\$107,079   |
| <b>SCENARIO C</b>                               |            |            |             |            |             |            |              |
| 500 kw CHP, 80% avail, 12 outages, with ratchet | \$3,840    | \$154,643  | \$141,448   | \$216,253  |             | \$516,183  | \$296,091    |
| SCENARIO C LESS SCENARIO A                      |            |            |             |            |             |            | -\$71,317    |
| <b>SCENARIO D - SUPPLEMENTAL SERVICE</b>        |            |            |             |            |             |            |              |
| 500 kw CHP 100% avail, with ratchet             | \$3,840    | \$97,643   | \$111,152   | \$179,701  |             | \$392,336  | \$208,794    |
| SCENARIO D LESS SCENARIO A                      |            |            |             |            |             |            | -\$158,614   |